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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Bruce W. McGaughy

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EXAMINER

PATEL, SHAMBHAVI K

ART UNIT

PAPER NUMBER

2128

DATE MAILED: 04/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/724,277	Applicant(s) MCGAUGHY ET AL.	
	Examiner Shambhavi Patel	Art Unit 2128	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 November 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>11/26/03</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claims 1-21 are pending.

Specification

1. The attempt to incorporate subject matter into this application by reference to the applications cited on page 1 of the specifications is ineffective because the reference documents are not clearly identified as required by 37 CFR 1.57(b)(2).

The incorporation by reference will not be effective until correction is made to comply with 37 CFR 1.57(b), (c), or (d). If the incorporated material is relied upon to meet any outstanding objection, rejection, or other requirement imposed by the Office, the correction must be made within any time period set by the Office for responding to the objection, rejection, or other requirement for the incorporation to be effective. Compliance will not be held in abeyance with respect to responding to the objection, rejection, or other requirement for the incorporation to be effective. In no case may the correction be made later than the close of prosecution as defined in 37 CFR 1.114(b), or abandonment of the application, whichever occurs earlier.

Any correction inserting material by amendment that was previously incorporated by reference must be accompanied by a statement that the material being inserted is the material incorporated by reference and the amendment contains no new matter. 37 CFR 1.57(f).

Claim Rejections - 35 USC § 112

2. Claims 15-21 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claims 15-21 are rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not enabling. The definition of the term 'medium' is critical or essential to the practice of the invention, but not included in the claim(s) is not enabled by the disclosure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976). The specification and claims fail to disclose what the applicant regards as appropriate computer medium.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

3. **Claims 1-21** are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

As per claims 1, 8, and 15, the examiner asserts that the current state of the claim

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language is such that a reasonable interpretation of the claims would not result in any concrete or tangible products. After the dynamic database for the group circuit has been determined, the group circuit is simulated. However, there is no evidence that simulating the group circuit produces a tangible result.

All other claims are rejected by virtue of their dependency.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-21 are rejected under 35 U.S.C. 102(e) as being anticipated by Zhou et al., herein referred to as Zhou (US Patent No. 6,807,520).

As per **claim 1, 8, and 15**, Zhou is directed to:

- a. representing the circuit as a *hierarchically arranged* set of branches, including a root branch and a plurality of other branches logically organized in a graph (column 12 lines 64-65); the hierarchically arranged set of branches including a

first branch tat includes one or more leaf circuits and a second branch that included one or more leaf circuits; wherein the first branch and second branch are interconnected in the graph through a third branch at a higher hierarchical level in the graph than the first and second branches (figure 8)

- b. creating a *static database* in accordance with a netlist description of the circuit, the static database including *topology information* of the circuit (column 12 lines 2-6, 12-16)
- c. *selecting a group circuit for simulation*, the group circuit comprises one or more leaf circuits selected from the first branch and the second branch (column 13 lines 28-35)
- d. creating a *dynamic database* for representing the group circuit, the dynamic database including references to the static database for fetching topology information dynamically during simulation (column 13 lines 17-27). Figure 10 shows a connection between the dynamic database of a cell and the static database of a cell.
- e. simulating the group circuit in accordance with the dynamic databases (column 13 lines 58-67)

Regarding claim 8, Zhou discloses:

- a. a processing unit for executing computer program (figure 1 processor 101; column 4 lines 60-67)

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- b. a user interface for entering and viewing a netlist representation of the circuit and viewing simulation results (figure 1 display device 105 input 106 cursor control 107; column 5 lines 18-30; column 13 lines 57-67)
- c. a memory for storing a static and dynamic database of the circuit (column 5 lines 3-14)

As per **claim 2, 9, and 16**, Zhou is directed to the method of claim 1 further comprising partitioning the circuit into a hierarchical data structure consisting one or more static branch circuits, each static branch circuit containing one or more functional calls, wherein each functional call contains reference to another static branch circuit or to a static leaf circuit at a lower hierarchy and identifying topology information between the static branch circuits and the static leaf circuits (column 12 lines 14-40). The static database is stored in memory and is partitioned along hierarchical boundaries. If two stages are identical, they can share static information.

As per **claim 3, 10, and 17**, Zhou is directed to the method of claim 2, wherein the step of identifying topology information further comprises:

- a. determining whether a topological graph of two or more circuits are substantially the same (column 12 lines 14-26)
- b. creating a hierarchical data structure with references to *one common circuit* for representing the two or more substantially the same circuits (column 12 lines 14-26)

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If the static information for two leaf cells is identical, they will both share the static information.

As per **claim 4, 11, and 18**, Zhou is directed to the method of claim 1 wherein the step of creating the static database further comprises:

flattening a selected group of leaf circuits to form a single flatten leaf circuit (column 12 lines 46-55);

representing resistor-capacitor networks with corresponding electrically substantially equivalent resistor-capacitor networks having fewer resistor or capacitor elements (column 5 lines 59-67; column 6 lines 1-6)

combining tightly coupled leaf circuits into a single merged leaf circuit in accordance with a set of predefined coupling conditions (column 13 lines 11-17).

As per **claims 5, 12, and 19**, Zhou is directed to the method of claim 1, wherein the step of creating the dynamic database comprises:

creating a group matrix solver for solving the matrix representation of the one or more leaf circuits within the group circuit (column 6 lines 50-57)

creating one or more input and output ports for each leaf circuit in the group (column 7 lines 3-18)

creating one or more loads for each leaf circuit in the group, wherein each load represents the impedance and capacitance observed at the input port of a leaf circuit (column 5 lines 59-63; column 7 lines 3-18). The capacitance and impedance is included in the output load of each

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node, and the voltage needed for driving the load is represented in the vectors stored in the matrix.

creating a port connectivity interface for connecting the input ports, output ports and loads between the leaf circuits, wherein the port connectivity interface communicates changes in signal conditions among the one or more leaf circuits within the group circuit (column 7 lines 15-18).

As per **claims 6, 13 and 20**, Zhou is directed to the method of claim 5, wherein the port connectivity interface comprises;

- a. a set of input and output vectors for referencing to a set of input and output ports of one or more receiver and driver leaf circuit (column 7 lines 2-18). The vector y includes the voltage on input nodes, and the vector x contains voltages outputted to the next stage
- b. a set of load vectors for referencing to a set of loads of the one or more driver leaf circuits (column 7 lines 2-18). The vector x contains the voltage driven to the next stage of the circuit (i.e. the voltage driven to the loads).
- c. an array of storage elements for storing information associating the set of loads to the set of input ports (column 7 lines 7-8). A matrix is created to store these two vectors and solve the resulting equation.

As per **claim 7, 14, and 21**, Zhou is directed to the method of claim 1, wherein the step of creating the dynamic database further comprises:

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creating one or more dynamic branch circuits mirroring the static branch circuits in the hierarchical data structure, each dynamic branch circuit containing one or more functional calls, each functional call contains reference to another dynamic branch circuit or to a dynamic leaf circuit at a lower hierarchy (column 13 lines 17-28);

identifying connectivity information between the dynamic branch circuits and the dynamic leaf circuits (column 13 lines 17-28)

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Conclusion


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shambhavi Patel whose telephone number is 571 272 5877. The examiner can normally be reached on 7:30 am - 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamini Shah can be reached on (571)272-2279. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Shambhavi Patel
Examiner
Art Unit 2128

SP


KAMINI SHAH
SUPERVISORY PATENT EXAMINER